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# The impact of low vision on activities of daily living, symptoms of depression, feelings of anxiety and social support in community-living older adults seeking vision rehabilitation services

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## Abstract

**Purpose** Previous studies showed that older persons with vision loss generally reported low levels of health-related quality of life, although study outcomes with respect to feelings of anxiety and social support were inconsistent. The objective of this study was to examine the impact of low vision on health-related quality of life, including feelings of anxiety and social support, among community-living older adults seeking vision rehabilitation services. **Methods** Differences of activities of daily living (Groningen Activity Restriction Scale—GARS), symptoms of depression and feelings of anxiety (Hospital Anxiety and Depression Scales—HADS) and social support (Social Support Scale Interactions—SSL12-I) between 148 older persons  $\geq 57$  years with low vision and a reference population ( $N = 4,792$ ) including eight patient groups with different chronic conditions were tested with Student's  $t$  tests.

**Results** Older persons with vision loss reported poorer levels of functioning with respect to activities of daily living, symptoms of depression and feelings of anxiety as compared to the general older population as well as compared to older patients with different chronic conditions. In contrast, older persons with vision loss reported higher levels of social support.

**Conclusions** Vision loss has a substantial impact on activities of daily living, symptoms of depression and feelings of anxiety. Professionals working at vision rehabilitation services may improve their quality of care as they take such information into account in their intervention work.

**Keywords** Low vision · Aged · Quality of life · Chronic disease · Activities of daily living · Mental health · Social support

## Abbreviations

ADL	Activities of daily living
GARS	Groningen activity restriction scale
GLAS	Groningen longitudinal aging study
HADS	Hospital anxiety and depression scale
HADS-D	Hospital anxiety and depression scale—depression subscale
HADS-A	Hospital anxiety and depression scale—anxiety subscale
SSL12-I	Social support list 12-interactions

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## Introduction

Low vision in old age is prevalent, and due to demographic changes, the prevalence will increase substantially in the future [1–3]. In the Netherlands, the prevalence of low

vision among persons 50 years of age and older was estimated 3.3% in 2008 but will increase by 18% in 2020 [2]. Low vision is associated with negative outcomes such as limitations in activities of daily living [4–7], physical dysfunctioning [8], depressive symptoms [5, 6, 9–13] and lower health-related quality of life [7, 14–18]. However, previous studies yielded mixed results regarding feelings of anxiety [9, 11] and social support interactions [4, 6, 10, 19].

Far most studies analyzed only associations between *severity* of vision impairment and daily functioning in (older) persons with vision loss. And although some studies examined the impact of low vision by comparing older adults with and without vision impairment [4, 7–9, 11, 14, 16, 17], only a very few compared older persons with low vision with older persons with other chronic conditions in order to study its relative impact on the aspects of daily functioning [7, 17]. Both types of knowledge may help to estimate the impact of low vision on daily functioning in older adults, however. Professionals working at vision rehabilitation services may improve their quality of care as they can take into account such information in their intervention work.

We had two aims for the present study. First, to compare the levels of health-related quality of life (i.e., activities of daily living, symptoms of depression, feelings of anxiety and social support) of older people with vision loss seeking vision rehabilitation services with a reference group of older people from the general population. And second, to compare the levels of health-related quality of life of older people with vision loss with older people with different chronic conditions.

## Method

### Study group

The study group was recruited as part of a randomized controlled trial to evaluate orientation and mobility training by the two main (not-for-profit) organizations for low vision care in the Netherlands: ‘Bartiméus’ and ‘Royal Dutch Visio’ (<http://www.visio.org/home>). Details of the recruitment strategy were published elsewhere [20, 21]. The initial study sample consisted of 149 adults  $\geq 55$  years of age who lived independently or in a home for older people, applied for low-vision rehabilitation services (either by themselves or referred by other health care professionals) and were screened as potentially qualified for mobility training in the use of an identification cane. The latter was performed during an intake conversation by mobility experts of the rehabilitation centre and implies that the client has sufficient remaining vision to see, for instance, large obstacles but may have difficulty

recognizing acquaintances. For reasons of comparison with the reference group (persons  $\geq 57$  years of age), we excluded one person of 55 years, resulting in a study group of 148 persons of  $\geq 57$  years. Persons with cognitive impairment were excluded in both study samples [21, 22].

The Medical Ethical Committee of Maastricht University/Academic Medical Hospital Maastricht granted approval for conducting this study and the research adhered to the tenets of the Helsinki Declaration.

### Measures

Data were collected by telephone interviews between January 2008 and January 2010. The interviews included questions about socio-demographics, such as age, gender, educational level and living arrangements.

Health-related quality of life was measured in three domains. First, activities of daily living (ADLs) were assessed with the Groningen Activity Restriction Scale (GARS [23]). The scale consists of 11 items. Scale scores theoretically range from 11 to 44 with higher scores indicating more restrictions in ADL, i.e., poorer functioning.

Second, psychological distress was assessed with the 14-item Hospital Anxiety and Depression Scale (HADS) that was validated in Dutch older persons [24, 25]. The scale consists of two 7-item subscales for symptoms of anxiety and depression, respectively. Total scores theoretically range from 0 to 42 for the full scale and from 0 to 21 for each subscale. Higher scores indicate higher levels of psychological distress.

Finally, social support interactions were measured with the Social Support Scale Interactions (SSL12-I) that was validated in older persons [26]. The scale comprises 3 subscales: ‘everyday social support’ (4 items: referring to social companionship and daily emotional support), ‘support in problem situations’ (4 items: referring to instrumental support, informative support and emotional support in times of trouble), and ‘esteem support’ (4 items: referring to support resulting in self-esteem and approval). Total scores theoretically range from 12 to 48 for the full scale and from 4 to 12 for each subscale. Higher scores indicate more social support.

### Analyses

After computing summary scores for the health-related quality of life variables, we compared the mean scores and standard deviations of these variables with reference outcomes of the baseline assessment of the Groningen Longitudinal Aging Study (GLAS [22, 27]). GLAS—conducted between 1993 and 2001—is a Dutch population-based prospective follow-up study of determinants of health-related quality of life in persons  $\geq 57$  years of age.

For the present study, we included baseline data collected with the previously described instruments from 4,792 persons (see [22]).

First, we compared the scores of the low-vision study group ( $N = 148$ ) with the GLAS reference population ( $N = 4,792$ ) and according to three age groups, i.e., 57–74, 75–84 and  $\geq 85$  years. Next, we compared the mean scores and standard deviations of the study group with those of eight groups with specific chronic conditions from GLAS: asthma/chronic bronchitis, heart condition, hypertension, diabetes mellitus, back problems, rheumatoid arthritis/other joint complaints, migraine/chronic headache and dermatological disorders [22]. Only “active” conditions were included (i.e., conditions for which a physician was consulted or medicines were used in the 12 months prior to the interview [22]). Differences were tested with Student’s *t*-test. Data were analyzed with PASW version 17.0 and GraphPad Prism [28].

## Results

### Study group

Socio-demographic characteristics of the low-vision group are described in Table 1. (Self-reported) duration of low vision was on average 18 years and varied from 1 to 82 years.

Table 2 presents the mean scores and standard deviations of the measures for the full study and reference groups, as well as according to the three age groups. The low-vision study sample reported poorer functioning regarding ADLs and psychological distress. However, levels of social support interactions were higher for the low-vision study group. Generally, differences were largest for the younger participants and smallest for the older participants.

Table 3 shows the outcomes of the comparison of the low-vision sample with the patients with different chronic conditions. Participants from the low-vision sample

reported the poorest levels of functioning regarding ADLs and psychological distress except for feelings of anxiety for patients with back pain and for patients with migraine/chronic headache. However, the differences for the latter two groups were not significant. In contrast, the levels of social support interactions were significantly highest for the participants in the low-vision study group.

## Discussion

In this study, we examined the impact of low vision on health-related quality of life among older adults seeking vision rehabilitation services. We found that older persons with vision loss generally reported poorer levels of functioning with respect to ADLs, symptoms of depression and feelings of anxiety as compared to the general older population, as well as compared to older patients with different chronic conditions. In contrast, older persons with vision loss reported more social support in all domains. Particularly levels of support in problem situations were higher among people with low vision compared to the general population. A reasonable explanation could be that low-vision problems and associated physical and mental health problems may provoke the needed social interactions and other kinds of support by particularly this group. Previous studies supported our findings with respect to ADLs and symptoms of depression (see Introduction) but showed inconsistent results with respect to both feelings of anxiety and social support interactions [4, 6, 9–11, 19].

Post hoc analyses showed that, although measured slightly different, low-vision patients with a heart condition ( $N = 50$ ), rheumatoid arthritis/back problems/osteoporosis ( $N = 43$ ), COPD/asthma/emphysema ( $N = 27$ ) or diabetes mellitus ( $N = 24$ ) reported higher GARS and HADS scores compared to the patients of the GLAS reference population indicating poorer levels of functioning. However, the differences for diabetes mellitus were not significant ( $P > .05$ ) likely due to the limited number of these patients in the study group. The SSL12-I total scores were also higher for these low-vision patient groups although the differences for heart conditions and COPD/asthma/emphysema patients were not significant. This supports our finding that low vision has a negative impact on physical and mental functioning, even irrespective of chronic conditions.

Our study has several limitations. First, although outcomes in the low-vision study group and reference population were measured with the same instruments, differences may exist in characteristics of both samples. However, mean age (77.4 years, SD 8.8 in study group and 77.1 years, SD 8.2 in reference population—not significant) and sex distribution (56.8% women in study group

**Table 1** Socio-demographic characteristics of the low-vision study group

<i>N</i>	148 (100%)
Mean age in years ( $\pm$ SD, range)	77.4 ( $\pm$ 8.8; 57–97)
Female ( <i>N</i> , %)	84 (56.8%)
Living alone status ( <i>N</i> , %)	77 (52.0%)
Highest educational level ( <i>N</i> , %)	
Low: elementary school, lower vocational	68 (45.9%)
Middle: medium vocational/high school	53 (35.8%)
High: higher vocational/university	25 (16.9%)
Unknown	2 (1.4%)

**Table 2** Mean scores and standard deviations of ADLs, psychological distress and social support interactions for low-vision study group and reference population by age groups

	Total groups						Age 57–74 years						Age 75–84 years						Age ≥85 years					
	N = 148			N = 4,792			N = 54			N = 3,430			N = 67			N = 1,161			N = 27			N = 201		
	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD	Low-vision study group	Reference population	SD
<b>ADLs</b>	M	SD	M	M	SD	M	M	SD	M	SD	M	SD	M	SD	M	M	SD	M	SD	M	M	SD	M	SD
GARS ADL <sup>a</sup>	15.45***	3.24	13.03	4.96	15.07***	3.35	12.25	3.08	15.49	2.90	14.49	4.62	16.11	3.78	18.01	6.47								
Psychological distress <sup>a</sup>																								
Symptoms of depression HADS-D	5.80***	4.04	4.34	3.55	6.35***	4.84	4.05	3.41	5.66	3.51	5.01	3.76	5.04	3.48	5.39	3.91								
Feelings of anxiety HADS-A	5.55***	4.34	3.94	3.61	6.11***	5.08	3.92	3.59	5.25*	3.94	4.07	3.72	5.15*	3.64	3.36	3.33								
HADS total score	11.34***	7.70	8.28	6.29	12.46***	9.39	7.97	6.16	10.91*	6.78	9.09	6.55	10.19	5.85	8.80	6.41								
Social support interactions <sup>b</sup>																								
Everyday support SSL12-I	10.01**	2.42	9.48	1.94	10.26**	2.59	9.55	1.90	9.99**	2.24	9.31	2.00	9.59	2.53	9.31	2.26								
Support in problem situations SSL12-I	8.62***	2.59	7.48	2.16	8.67***	2.53	7.35	2.05	8.82***	2.66	7.84	2.36	8.04	2.55	7.78	2.44								
Esteem support SSL12-I	9.16***	2.51	8.50	2.11	10.02***	2.55	8.65	2.07	8.91**	2.47	8.19	2.09	8.07	2.04	7.77	2.41								
SSL12-I total score	27.75***	6.06	25.47	4.99	28.94***	5.82	25.55	4.84	27.65***	6.11	25.34	5.27	25.70	6.07	24.88	5.77								

M mean score, SD standard deviation

\*  $P < .05$ ; \*\*  $P < .01$ ; \*\*\*  $P < .001$ , significant difference between low-vision study group and reference group, Student's  $t$ -test, two-sided<sup>a</sup> Higher scores indicate poorer functioning<sup>b</sup> Higher scores indicate more social support interactions

**Table 3** Mean scores and standard deviations of ADLs, psychological distress and social support interactions for low-vision study group and eight chronic conditions

	Low-vision study group		Reference population															
	N = 148		N = 461		N = 866		N = 1,079		N = 334		N = 469		N = 695		N = 297		N = 290	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Asthma/chronic bronchitis																		
Heart condition																		
Hypertension																		
Diabetes mellitus																		
Back problems																		
Rheumatoid arthritis/other joint problems																		
Migraine/chronic headache																		
Dermatologic disorders																		
ADLs																		
GARS ADL <sup>a</sup>	15.45	3.24	14.20**	4.81	14.01***	4.53	13.49***	4.18	14.92	5.27	14.89	4.96	15.20	5.18	13.69***	4.76	13.70***	4.70
Psychological distress <sup>a</sup>																		
Symptoms of depression	5.80	4.04	5.25	3.60	5.34	3.88	4.69***	3.67	5.32	3.89	5.37	3.67	5.32	3.62	5.69	4.12	4.76**	3.59
HADS-D																		
Feelings of anxiety	5.55	4.34	4.82	3.84	4.63***	3.89	4.41***	3.80	4.37**	3.93	5.56	4.11	5.11	3.98	6.23	4.24	4.65*	4.02
HADS-A																		
HADS total score	11.34	7.70	10.07*	6.54	9.99*	6.79	9.09***	6.53	9.69*	6.80	10.96	6.90	10.43	6.64	11.92	7.43	9.41**	6.74
Social support interactions <sup>b</sup>																		
Everyday support	10.01	2.42	9.39**	1.94	9.42**	1.97	9.50**	1.92	9.53*	1.99	9.53*	1.89	9.62*	1.98	9.41**	1.98	9.28**	2.05
SSL12-I																		
Support in problem situations	8.62	2.59	7.72***	2.10	7.74***	2.16	7.70***	2.14	7.80***	2.23	7.77***	2.12	7.89***	2.17	7.82***	2.07	7.69***	2.11
SSL12-I																		
Esteem support	9.16	2.51	8.49**	2.03	8.35***	2.10	8.42***	2.09	8.60*	2.30	8.65*	2.10	8.55***	2.15	8.69*	2.25	8.55**	2.13
SSL12-I total score	27.75	6.06	25.60***	4.94	25.51***	5.05	25.62***	4.95	25.94**	5.29	25.95***	4.96	26.07***	5.10	25.91***	5.09	25.53***	5.04

M mean score, SD standard deviation

\*  $P < .05$ ; \*\*  $P < .01$ ; \*\*\*  $P < .001$ , significant difference between low-vision study group and specific chronic condition, Student's *t*-test, two-sided<sup>a</sup> Higher scores indicate poorer functioning<sup>b</sup> Higher scores indicate more social support interactions



and 56.4% women in reference population—not significant) were similar in both groups. Second, chronic conditions were self-reported. To reduce report bias, only conditions for which a physician was consulted or medicines were used in the 12 months prior to the interview were included in both samples. Finally, the mode of administration of the GARS, HADS and SSL 12-I was slightly different in both settings: in the low-vision sample, all measures were assessed with telephone interviews while in GLAS the GARS was assessed in a face-to-face interview and the HADS and SSL 12-I were assessed with a questionnaire during this interview.

We conclude that vision loss has a negative impact on ADLs, symptoms of depression and feelings of anxiety in older people. However, social support was highest in the low-vision sample. Professionals working at vision rehabilitation services may improve their quality of care as they take such information into account in their intervention work.

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